

# ROBOTICS STEM EXPLORATION

Through live webinars with NASA engineers, exploring the LaunchPad, and building your own robot, complete this worksheet to demonstrate your knowledge of robotics. This worksheet will not be turned in and for your own use to demonstrate knowledge of robots.

## SAFETY



What are likely hazards you may encounter while working with robots?

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What should you do to anticipate, mitigate and prevent, and respond to these hazards listed above?

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Describe the appropriate safety gear and clothing that should be used when working with robotics.

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# ROBOTICS STEM EXPLORATION (CONTINUED)

List first aid and prevention for the types of injuries below that could occur while participating in robotics activities and competitions.

## Cuts –

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## Eye Injuries –

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## Chemical Burns –

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## Heat Burns –

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# ROBOTICS INDUSTRY

List the kinds of things robots can do.

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How are robots best used today?

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List the similarities and differences between remote-control vehicles, telerobots, and autonomous robots.

## Similarities –

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## Differences –

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# ROBOTICS STEM EXPLORATION (CONTINUED)

List three different methods that robots can use to move themselves other than wheels or tracks **and** describe when it would be appropriate to use each method.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_

## GENERAL KNOWLEDGE

Choose three of the five major fields of robotics below and describe their importance to robotics development.

**Human-robot interface    Mobility    Manipulation    Programming    Sensors**

**Field #1 =** \_\_\_\_\_

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**Field #2 =** \_\_\_\_\_

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**Field #3 =** \_\_\_\_\_

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**A HomeScouting  
Adventure**

- **Choose a task** for the robot or robotic subsystem that you plan to build. Include sensor feedback and programming in the task.
- **Design your robot.** The robot design should use sensors and programming and have at least 2 degrees of freedom.
- **Build a robot** or robotic subsystem of your original design to accomplish the task you chose. Then do one of the following:
  1. Program your robot to perform the task you chose for your robot.
  2. Prepare a flowchart of the desired steps to program your robot for accomplishing the task.
- **Test your robot** and record the results. Take photos of your robot to show!

**Take notes on what occurs when building and testing your robot below.**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# ROBOTICS STEM EXPLORATION (CONTINUED)

How well did your robot accomplish the task?

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What are improvements you would make?

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What did you learn from building and testing a robot?

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## COMPETITIONS

Learn about three youth robotics competitions, including the type of competition, time commitment, age of the participants, and how many teams are involved.

**Competition #1 =** \_\_\_\_\_

Type of competition = \_\_\_\_\_

Time commitment = \_\_\_\_\_

Age of participants = \_\_\_\_\_

How many teams are involved = \_\_\_\_\_

**Competition #2 =** \_\_\_\_\_

Type of competition = \_\_\_\_\_

Time commitment = \_\_\_\_\_

Age of participants = \_\_\_\_\_

How many teams are involved = \_\_\_\_\_

**Competition #3 =** \_\_\_\_\_

Type of competition = \_\_\_\_\_

Time commitment = \_\_\_\_\_

Age of participants = \_\_\_\_\_

How many teams are involved = \_\_\_\_\_

# ROBOTICS STEM EXPLORATION (CONTINUED)

## CAREERS

List three career opportunities in robotics.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Pick one of the above and learn about the education, training, and experience required for this profession.

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Why does this career in robotics interest you?

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